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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/005,586 | 10/29/2001 | Jun Ma | 100647-04010 | 8142 |

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[REDACTED] EXAMINER

HAILEY, PATRICIA L

| ART UNIT | PAPER NUMBER |
|----------|--------------|
| 1755 | 9 |

DATE MAILED: 11/06/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/005,586 | MA ET AL. | |
| | Examiner | Art Unit | |
| | Patricia L. Hailey | 1755 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 12 August 2002.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

4) Claim(s) 1-55 is/are pending in the application.

4a) Of the above claim(s) 37-55 is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-36 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Disposition of Claims

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.

2. Certified copies of the priority documents have been received in Application No. _____.

3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____

4) Interview Summary (PTO-413) Paper No(s). _____

5) Notice of Informal Patent Application (PTO-152)

6) Other: _____

Election/Restrictions

1. Applicant's election with traverse of Group I, claims 1-36 in Paper No. 8, filed on August 12, 2002, is acknowledged. The traversal is on the ground(s) that the Examiner has not presented a serious burden to conduct a search and examination of both inventions. This is not found persuasive because the mere fact that Inventions I and II are classified in different classes is considered a serious enough burden. Additionally, Applicants' have not addressed the Examiner's original statements supporting the restriction requirement, i.e., that the product as claimed can be used in another and materially different process of use, such as a process of producing or preparing electrodes.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 37-55 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected process for the isomerization of hydrocarbons, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 8.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. **Claims 1-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

The claims are indefinite because the phrase "a metal carbide selected from the group consisting of carbides and oxycarbides" is indefinite. An oxycarbide is considered to be different from a carbide. While both a carbide and an oxycarbide contain carbon atoms, a carbide does not require the presence of oxygen atoms, as does an oxycarbide.

Thus, claims 5 and 25 lack antecedent basis for the word "oxycarbides".

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

- (e) the invention was described in-
 - (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
 - (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:
 1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
9. **Claims 1-36 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Lieber et al. (U. S. Patent No. 6,190,634).**

Lieber et al. teach carbide articles consisting essentially of covalently bonded elements M¹, M², and C. M¹ can be selected from metals such as titanium, niobium, tungsten, molybdenum, zirconium, hafnium, vanadium, and tantalum; M² can be selected from metals such as nitrogen, phosphorus, and aluminum. See col. 1, lines 30-42 of Lieber et al.

The carbide article may be in the form of a nanorod, and may have a shorter axis (i.e., diameter, see col. 3, lines 4-6) of between 0.1 and 80 nm (0.001-0.08 µm) and a length between 0.02 and 50 µm. See col. 2, lines 44-54 of Lieber et al. From this, one of ordinary skill in the art could easily determine and obtain a length to diameter ratio greater than 5.

Additionally, impurities such as oxygen or halogen may be present in or on the carbide lattice material. The sources of these impurities are typically the reactants (metal oxides, transport agents) employed during the production of the carbide nanotubes. See col. 2, lines 55-64 of Lieber et al.

The nanorods are synthesized by reacting carbon nanotubes with a volatile metal or non-metal species. The reaction is carried out under static conditions with the reaction temperature dictated by the gas-phase transport of the oxide/halide reactants and carbide growth. See col. 5, lines 11-23 and the Examples of Lieber et al., which reaction also includes a drying step (Example 1).

In the reaction, a carbon nanotube is reacted with either a transition metal and a halogen transport molecule (e.g., iodine, bromine, chlorine), or with a metal or non-

metal oxide and a halogen transport agent to form a carbide. See col. 5, line 57 to col. 6, line 43 of Lieber et al. This disclosure is considered to read upon the claim limitations regarding the acidification of the nanostructures, given that the halogen transport molecules of Lieber et al. are the same as the claimed acidifying compounds recited in, for example, claim 10.

The nanorods typically consist of at least 90% (generally 95%) of the carbon and designated metal or non-metal elements. See col. 3, lines 27-40 of Lieber et al.

The nanorods are multifunctional. See col. 6, lines 44-67 of Lieber et al.

Although this reference does not specifically recite the phrase "catalytic composition", Lieber et al. is considered to inherently read upon this phrase, given that the nanorods of Lieber et al. teach carbide nanorods having lengths and diameters that read upon that respectively claimed. Additionally, the property of ammonia desorption peak recited in the instant claims is also considered inherently read upon by Lieber et al. for these reasons.

In view of these teachings, Lieber et al. anticipate claims 1-36.

In the alternative:

While Lieber et al. do not expressly recite the property of ammonia desorption peak, it would have been obvious to one of ordinary skill in the art at the time the invention was made to expect the carbon nanorods of Lieber et al. to exhibit an ammonia desorption property comparable to that respectively claimed (absent the

showing of convincing evidence to the contrary), because the nanorods of Lieber et al. structurally read upon the claimed "catalytic composition".

It is well settled that when a claimed composition appears to be substantially the same as a composition disclosed in the prior art, the burden is properly upon the applicant to prove by way of tangible evidence that the prior art composition does not necessarily possess characteristics attributed to the CLAIMED composition. In re Spada, 911 F.2d 705, 15 USPQ2d 1655 (Fed. Circ. 1990); In re Fitzgerald, 619 F.2d 67, 205 USPQ 594 (CCPA 1980); In re Swinehart, 439 F.2d 2109, 169 USPQ 226 (CCPA 1971).

Information Disclosure Statement

The Information Disclosure Statement filed by Applicants on January 29, 2002, will be considered by the Examiner once the parent application (Serial No. 09/481,184) becomes available. Applicants have stated that copies of the references cited in the 6/11/02 IDS "are not enclosed" in this application "because they were either previously cited by or submitted" in the parent application.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patricia L. Hailey whose telephone number is (703) 308-3317. The examiner can normally be reached on Mondays-Thursdays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark L. Bell can be reached on (703) 308-3823. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-0661.

Lynn Hailey
Lynn Hailey/plh
Examiner, Art Unit 1755
November 4, 2002

Mark L. Bell
Mark L. Bell
Supervisory Patent Examiner
Technology Center 1700